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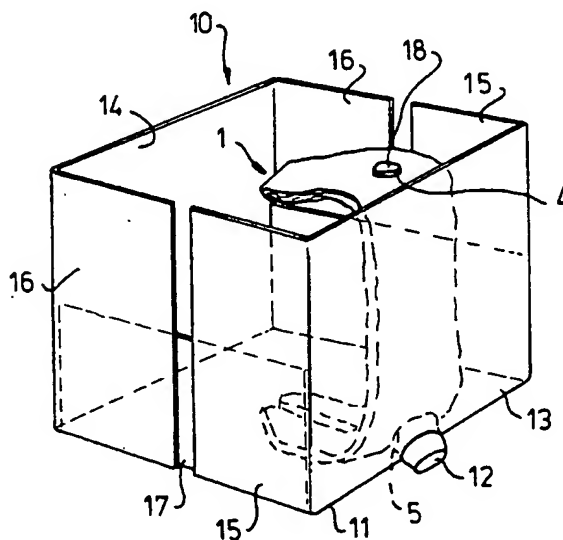
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(54) Title: LINING FOR A BLOCK-SHAPED CONTAINER, AND TRANSPORT PACK FOR SAID LINING



(57) Abstract

A lining (1) for a block-shaped container, which lining is made of flexible material and can be placed folded in the container, and can then be brought to the desired shape in the container through filling. The lining is folded up or rolled up to the form of an elongated strip, which can be placed in the container in a position in which it extends with its lengthwise direction at least between the top edge and the bottom wall thereof, in such a way that during filling the lining can unfold relative to said lengthwise direction towards the two opposite sides.

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Lining for a block-shaped container, and transport pack for said lining

The invention relates to a lining for a block-shaped container,
5 which lining is made of flexible material and can be placed folded in the container, and can then brought to the desired shape in the container through filling. Such linings are generally used when a liquid or a powdered material has to be packed in a container which itself is not completely tight. The lining provides the desired barrier properties
10 (tightness), while the container supplies the desired strength for supporting the packed material. Such containers can be many different sizes, for example their capacity can be 1 cubic metre or a number of cubic metres.

The known lining comprises at least two identical sheets, with the
15 filling aperture in one sheet, and a shut-off valve/tap holder in the other sheet. During its fitting, the lining is folded together in such a way that it can be placed flat on the bottom of the container. During the subsequent filling of the lining, the top surface rises up, and the wall must gradually unfold in the vertical direction.

20 This known lining and the method of filling thereof give rise to problems. The internal pressure occurring during the filling, however small it may be, causes the unfolding wall to be pressed against the container. This produces friction, which increases as the internal excess pressure increases during the filling. The result of all this can be that
25 the lining is not unfolded completely, and that folds remain in the side wall of the container. Such folds give rise to tension concentrations in the lining material, which can lead to leakage. When filled, the lining can easily tear or become porous at those folded places, with the result that the contents can leak out. In practice, the filling of such linings
30 must also be carried out with great care, which means that the filling has to be carried out by experienced personnel.

The object of the invention is to provide a lining of the
abovementioned type which can be filled without problems in a block-shaped container, without the risk of the lining in its unfolded state
35 having significant folds. This object is achieved through the fact that the lining is folded up or rolled up to the form of an elongated strip, which strip can be placed in the container in a position in which it extends with its lengthwise direction at least between the top edge and the bottom wall thereof, in such a way that during filling the lining can

unfold relative to said lengthwise direction towards the two opposite sides.

The unfolding of the lining now takes place in the crosswise direction. If the folded-up or rolled-up lining is fixed in the centre of one of the side walls of the block-shaped container, a more or less symmetrical unfolding of the lining is obtained. During this, the unfolding lining is virtually unimpeded by the walls of the container, with the result that fold formation can largely be avoided. It also means that there is no need for the personnel handling the filling of the lining to check it constantly, with the result that processing is considerably facilitated.

The strip, in the direction of the connecting line between the two fixing points, preferably continues beyond the top edge, and preferably continues over the bottom wall with a piece of which the size, in the lengthwise direction of the strip, corresponds essentially to half the length of the bottom wall, in such a way that when folded up the strip can be placed over the entire length of a vertical wall of the container and over half the length of the bottom wall adjacent thereto. In the case of this embodiment it is ensured that the entire internal space of the block-shaped container can be filled up with the unfolded lining.

The lining is preferably made up of at least two identical rectangular or square pieces of flexible sheet material which are welded to each other at the edges, one sheet being provided with the fixing points. One of the fixing points is intended for fixing the strip at or near the bottom wall, which fixing point is in the form of an emptying outlet.

As already mentioned, the lining is placed in the container folded up or rolled up. It can be folded up in different ways here, these being determined by the position of the fixing points. According to a preferred embodiment, in which the pieces of sheet material are divided into at least two equal square halves by a bisecting line, the four corner parts of the halves are each folded towards the centre of the pieces, and the parts lying to the sides of the bisecting line are folded over or rolled up one or more times, in such a way that the lining forms a strip made up of several layers lying on top of one another.

During the filling of a lining folded up in this way, said lining unfolds symmetrically relative to the connecting line between the two fixing points.

The invention also relates to a unit, comprising a lining of the

type described above and a transport pack in which the lining can be placed, which transport pack comprises a number of panels which in the collapsed position enclose the lining and in the opened-out position can cover a number of walls and the bottom of the container. The transport
5 pack protects the fragile lining from damage during storage and transportation. For the rest, the lining can simply be placed with it in the container, with the tap lowered in the correct position in the bottom of the container. The dimensions of the panels of the transport pack are in fact selected in such a way that it fits precisely inside the
10 container and holds the lining ready in the desired position, in such a way that it can be filled by two simple actions.

The transport pack preferably comprises a central panel, the dimensions of which correspond to the bottom of the container, and also side panels which are provided at two opposite edges of the bottom, and
15 the dimensions of which correspond to those of two opposite walls of the container, in such a way that the side panels can be opened out on said walls when the central panel is placed on the bottom. The lining is fixed to the central bottom panel. After the side panel concerned has been opened out, the lining must be placed in the folded state against the
20 adjoining panel of the container and along the panel of the transport pack, using a tool developed for the purpose. The lining then lies in the correct position for filling.

The side panels of the transport pack can also be provided at both sides with auxiliary panels which can be opened out on the other two
25 walls of the container. All the walls of the container, apart from the lid, can thus be covered by the panels of the transport pack. A further protection of the lining is also obtained in this way, which is important if the internal surfaces of the container walls have irregularities.

It is observed that a unit, comprising a lining and its transport
30 pack, are also known from US-A-3143249. Said known transport pack comprises three panels, the dimensions of which correspond to the dimensions of the side walls of the container into which the complete unit is to be placed.

The lining is glued to the transport pack, over the full height of
35 the panels. After installation of the unit, the liner stretches over three adjoining vertical walls of the container.

Subsequently, the liner is unfolded whereby it is pressed against the bottom of the container. This contact between container bottom and the liner brings the risk that no complete unfolding is obtained.

Moreover, due to the fact that the liner is glued to the transport pack, it is not possible to give the liner an oversize with respect to the container.

Such oversized container may be applied very well according to the invention, as this lining is not fixed to its transport pack. By applying such oversized lining, the advantage is obtained that the risk of tension concentrations is further reduced.

The invention will be explained in greater detail below with reference to an example of an embodiment shown in the figures.

Figure 1 shows a lining according to the invention in a first stage of folding up.

Figure 2 shows the lining according to Figure 1 in a second stage of rolling up.

Figure 3 shows the completely folded-up and rolled-up lining in the partially opened-out transport pack.

Figure 4 shows the still folded-up and rolled-up lining in the completely opened-out transport pack.

Figures 5a, 5b and 5c show the successive inflation or filling stages of the lining in a container shown by dashed lines.

The partially folded lining 1 shown in Figure 1 comprises two pieces of flexible material 2, 3 which are fixed to each other at their edges. The filling aperture 4 and the emptying aperture 5 are disposed in the piece of flexible material which is uppermost in Figure 1.

In the stage of folding of the lining 1 shown, two corner parts 6 of the lining 1 are folded over towards the centre, thus leaving a strip 7 clear between them. When the other corner parts 6 of the lining 1 are folded over towards the centre, corresponding strips 7, in which the filling aperture 4 and the emptying aperture 5 are situated, remain clear.

Figure 2 shows that the lining is then rolled up. In the left half of Figure 2 the lining is already completely rolled up, while in the right half the lining has to be rolled up further.

In the completely folded-up and rolled-up state the lining 1 is then placed in the transport pack 10 shown in Figure 3. The filling aperture 4 can still be seen in Figure 3. The emptying aperture 5 is situated in the part of the lining 1 which is folded over through 180° and faces the central panel 11 of the transport pack 10. This central panel 11 is provided with a hole (not visible in Figure 3), through which a connecting piece 12 provided around the emptying aperture is inserted.

The transport pack has two side panels 13, 14, which are in turn each provided with auxiliary panels 15, 16. The central panel 11 also has two auxiliary panels 17. Figure 4 shows the transport pack 10 in the fully opened-out state. In this state it is lying in the container, but the latter is left out of Figure 4, for the sake of clarity. The central panel 11 of the transport pack 10 is situated on the bottom of the container (not shown), while the side panels 13 and 14 are opened up against two opposite container walls. The auxiliary panels 15 and 16 are then opened out, following which the auxiliary panels 17, fixed to the central panel 11, are opened out against the inside of said panels. The folded-up lining 1 can now be placed in the correct position, in which case the position of the emptying aperture 5 can also be seen.

The filling aperture 4 and the connecting piece 18 situated thereon must be retained at the top edge of the container wall in question, which is shown in further detail in Figure 5.

Figure 5 shows the lining 1, as fitted in the container. The container is shown by dashed lines, for the sake of clarity. For the rest, the transport pack 10 is not shown in any further detail.

The connecting piece 18 of the lining 1 is suspended by means of a bracket 19 from the top edge of the container wall, not shown in any further detail, while the emptying connecting piece 12 projects out through a corresponding aperture in said container wall or the bottom of the container. Figure 5a shows the filling hose 20, which is connected to connecting piece 18.

During the introduction of filling material the lining unfolds to both sides, from the bottom (see Figure 5b). Since the lining 1 can unfold freely, no fold formation occurs, with the result that the interior of the container can be filled.

Figure 5c shows the lining completely full. It is still inside the container, which for the rest is not shown. It can be seen clearly in this figure that the lining 1 is made up of the two pieces of sheet material 2, 3 fixed together by welding seam 23, the filling aperture 4 and the emptying aperture 5 being situated in the piece 2.

When filled, the lining 1 has at its top side two flaps 21, 22, which can be folded flat on the top side of the filled lining.

After emptying of the lining 1, the flexible sheet material can be folded up or crumpled up again in a simple manner, in such a way that the various panels of the transport pack 10 can be folded onto each other again. The used lining 1 can be transported again in its transport pack

10, or thrown away.

Claims

1. Lining for a block-shaped container, which lining is made of
5 flexible material and can be placed folded in the container, and can then
be brought to the desired shape in the container through filling,
characterised in that the lining is folded up or rolled up to the form of
an elongated strip, which strip can be placed in the container in a
position in which it extends with its lengthwise direction at least
10 between the top edge and the bottom wall thereof, in such a way that
during filling the lining can unfold relative to said lengthwise
direction towards the two opposite sides.
2. Lining according to Claim 1, in which the strip continues beyond
the top edge, and continues over the bottom wall with a piece of which
15 the size, in the lengthwise direction of the strip, corresponds
essentially to half the length of the bottom wall, in such a way that
when folded up the strip can be placed over the entire length of a
vertical wall of the container and over half the length of the bottom
wall adjacent thereto.
- 20 3. Lining according to Claim 2, in which it is made up of at least two
identical rectangular or square pieces of flexible sheet material which
are welded to each other at the edges, one sheet being provided with the
fixing points.
4. Lining according to Claim 3, in which a fixing point is provided
25 for fixing the strip at or near the bottom wall, which fixing point is in
the form of an emptying outlet.
5. Lining according to Claim 4, in which the pieces of sheet material
are divided into at least two equal square halves by a bisecting line,
the four corner parts of the halves are each folded towards the centre of
30 the pieces, and the parts lying to the sides of the bisecting line are
folded over or rolled up one or more times, in such a way that the lining
forms a strip made up of several layers lying on top of one another.
6. Lining according to Claim 5, in which the four corner parts are
folded over or rolled up, leaving clear at least a narrow space between
35 them, in which space the fixing points lie.
7. Unit, comprising a lining from one of the preceding claims, and
also a pack in which the lining can be accommodated, which pack comprises
a number of panels which in the collapsed position enclose the lining,
and in the opened-out position can cover a number of walls and the bottom

of the container.

8. Unit according to Claim 7, in which the pack comprises a central panel, the dimensions of which correspond to the bottom of the container, and side panels which are provided at two opposite edges of the bottom,
5 and the dimensions of which correspond to those of two opposite walls of the container, in such a way that the side panels can be opened out on said walls when the central panel is placed on the bottom, and the lining is fixed to one of the side panels.
9. Unit according to Claim 8, in which the side panels of the pack
10 have at both sides auxiliary panels which can be opened out on the other two walls of the container.
10. Pack for a unit according to one of Claims 7 - 9.
11. Fixing aid for temporarily fixing the lining according to one of the preceding Claims 1 - 6, at the top edge of the container, comprising
15 a retaining part for retaining the filling aperture, and also a hook part which can be hooked onto the top edge of the container.

fig-1

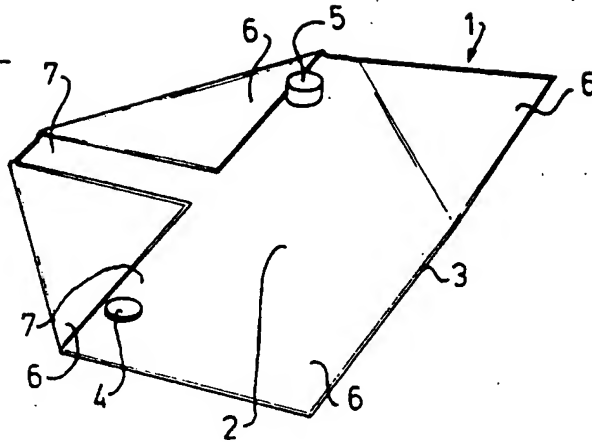


fig - 2

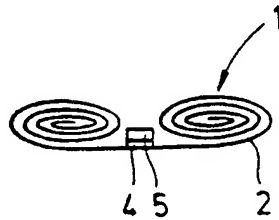


fig-3

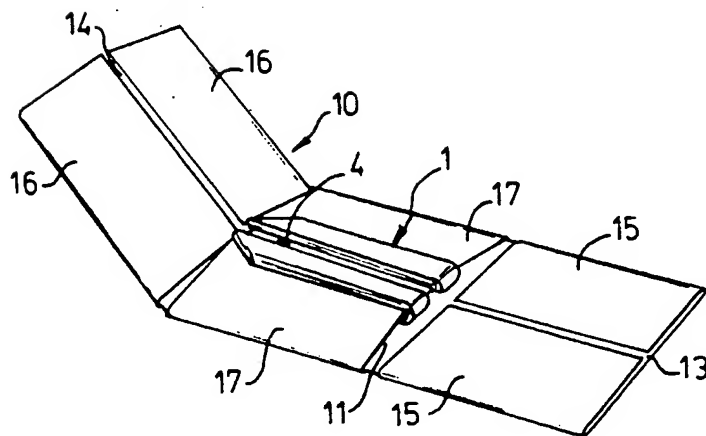


Fig - 4

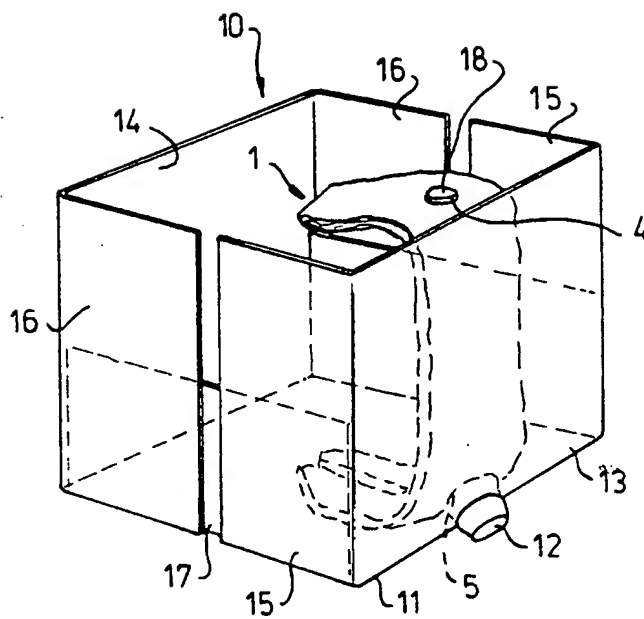
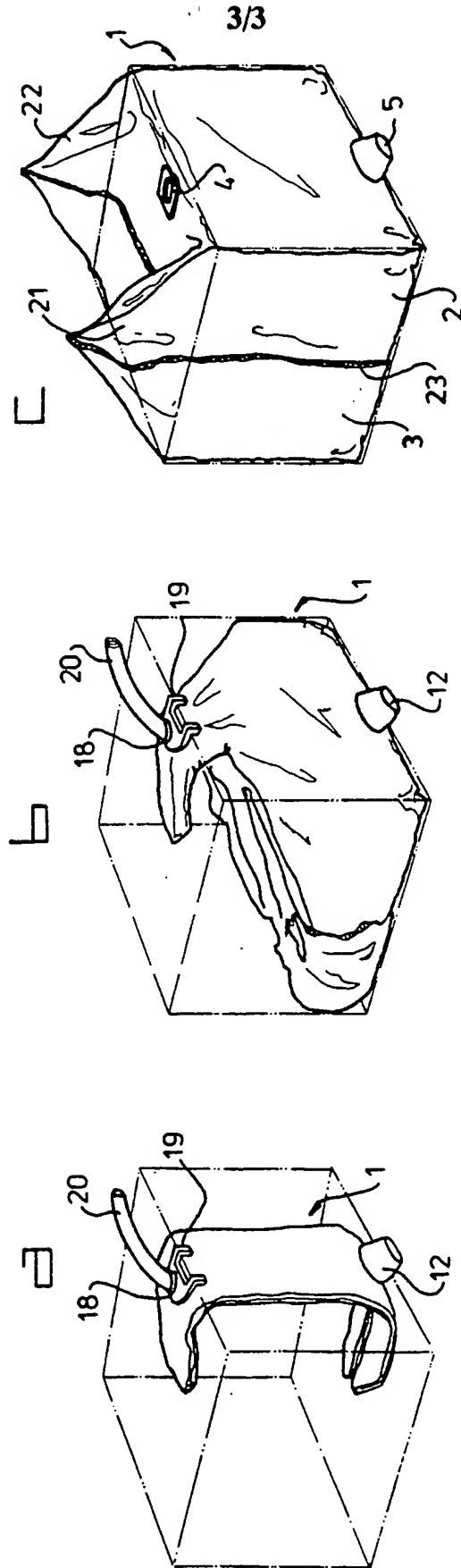


fig - 5



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